



Biodiesel Industry Update

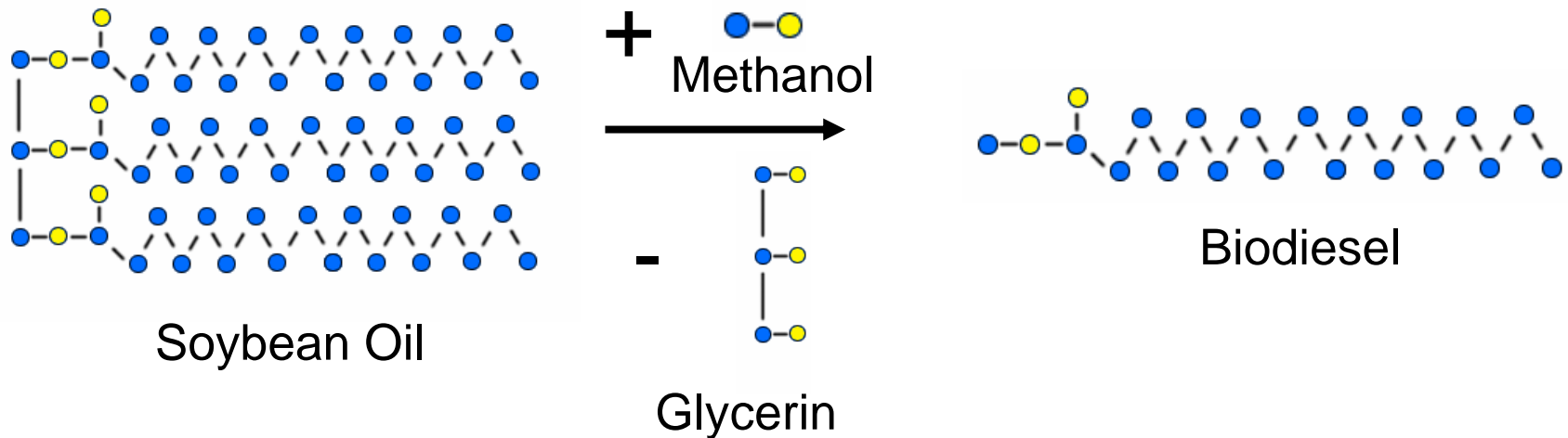
*Jeff Nelson
Stepan Company
Northfield, IL*

May, 2006

Biodiesel - Chemistry

It is not soybean oil, it is made FROM soybean oil

- Soybean oil is chemically altered to make Biodiesel, a mono alkyl ester (methyl ester)
- Soybean oil itself has too high a viscosity and the triglyceride can coke injectors



Biodiesel Attributes

- Works in existing diesel equipment
- High cetane value
 - 50 vs 42
- BTUs
 - 120m/gal vs 126m/gal
- Non-hazardous
 - DOT – Non-regulated
 - High flash point
- Good environmental profile
 - 0-2 ppm sulfur (vegetable)
 - Low particulate emissions
- Closed carbon loop
 - CO₂ is consumed by the plants
 - CO₂ is emitted when burned
- Positive energy balance of 3.2/1
 - 3.2 units out for every 1 unit in (Ref: DOE)

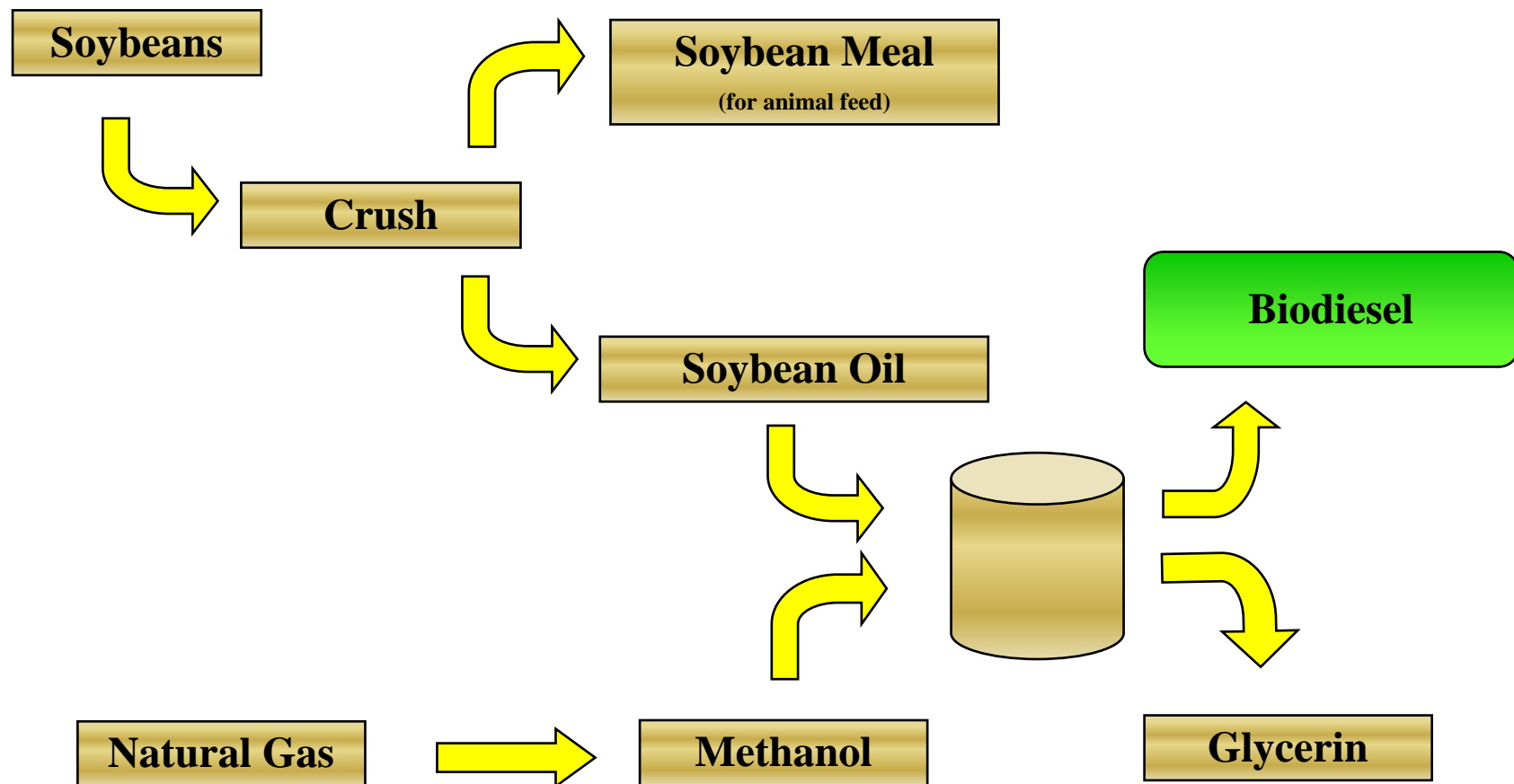


Biodiesel Attributes

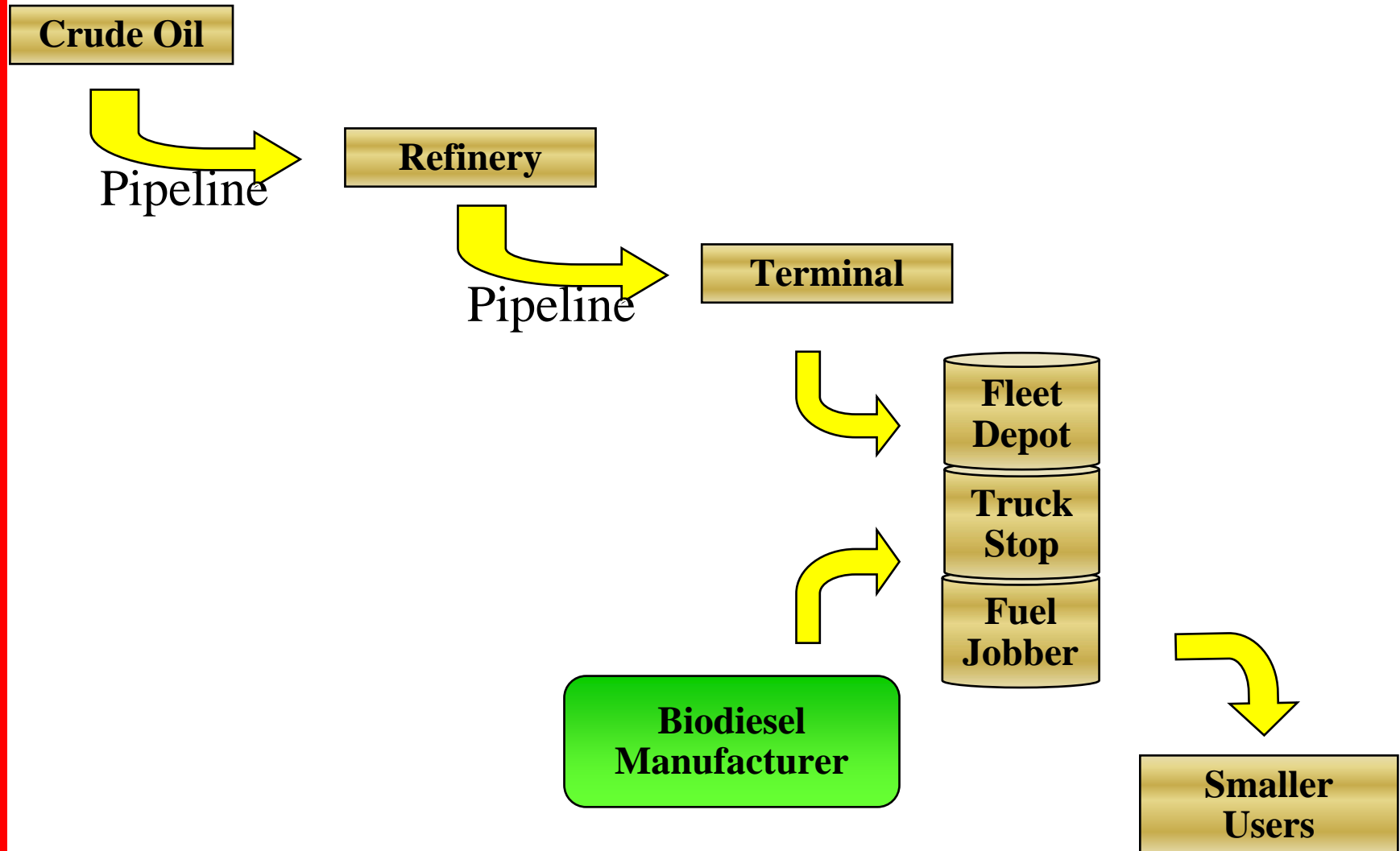
- Excellent Lubricity
 - Inherent property to biodiesel
 - » 1% increase lubricity 65%
 - Reduced injector pump failure



Supply Chain for Biodiesel



Current Supply Chain for Biodiesel

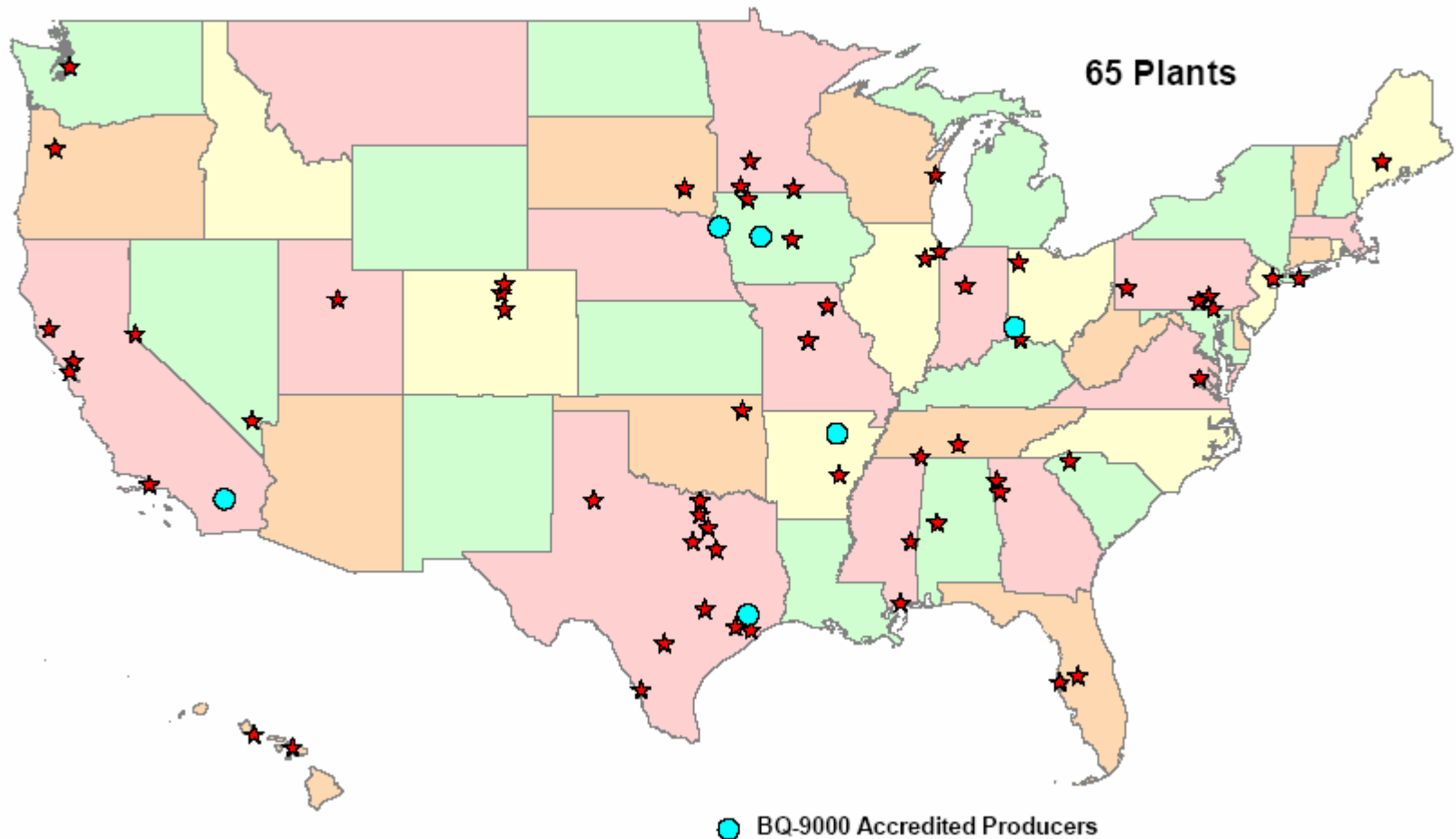




Biodiesel Capacity - Existing

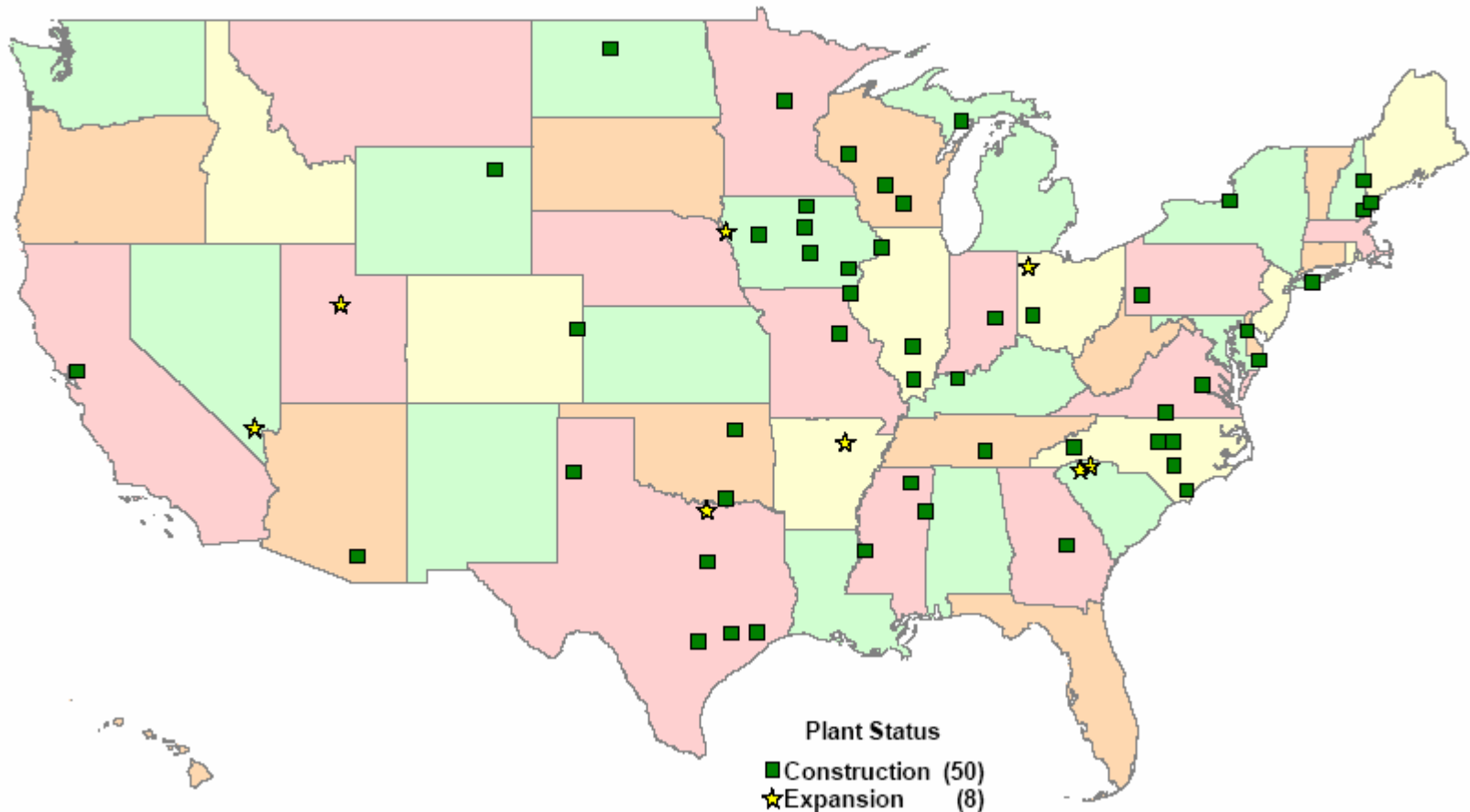
395 Million Gallons

Commercial Biodiesel Production Plants (April 28, 2006)

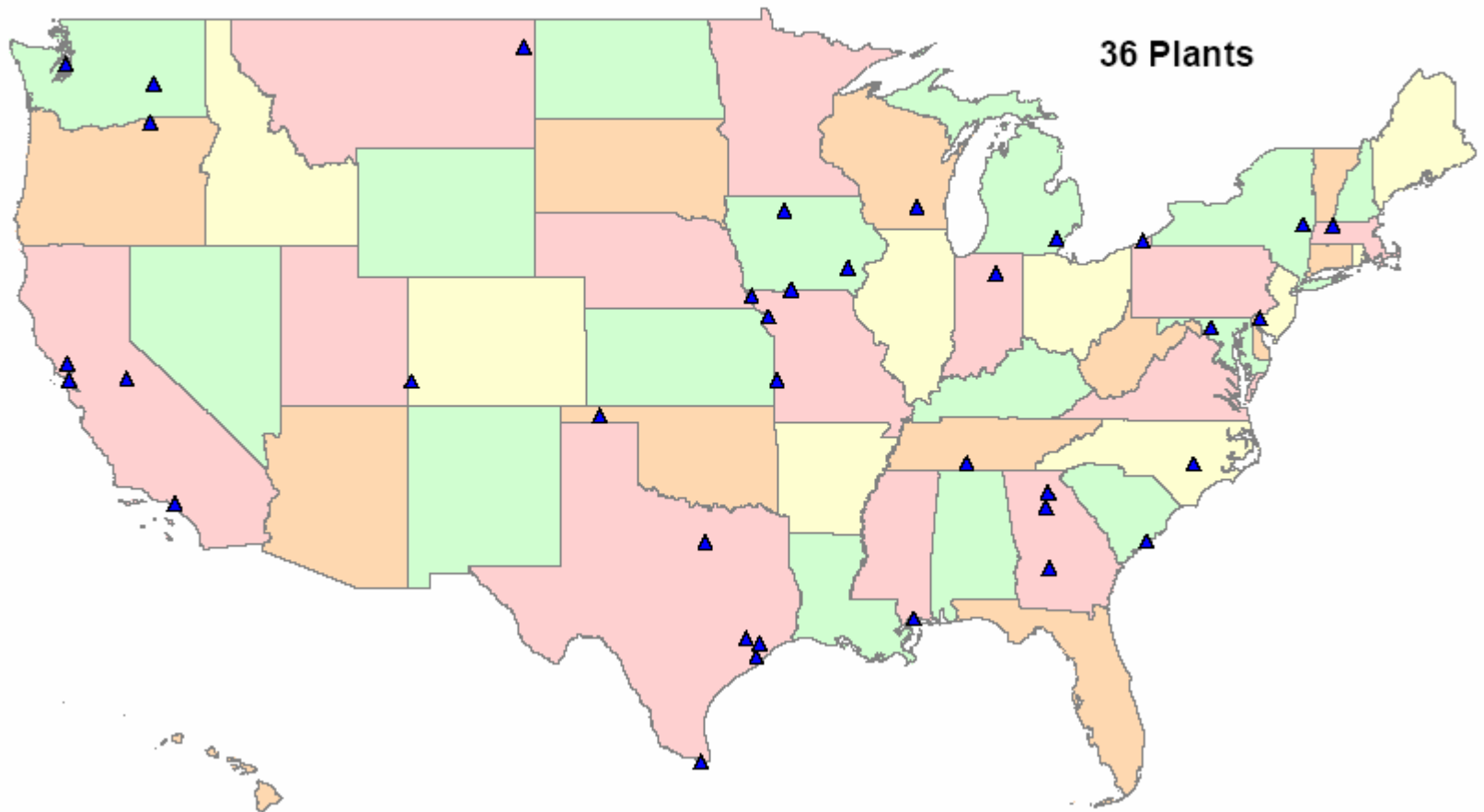


Biodiesel Capacity – Under Construction
714 Million Gallons

Biodiesel Production Plants Under Construction or Expansion (April 28, 2006)



36 Plants



Biodiesel Issues

Winter Use

- There were problems in December 2005
 - Quality problems
 - Volume growth – new users/new producers
- Industry Response:
 - Quality, Quality, Quality
 - BQ-9000
 - Tighten Specs
 - Train Users



Biodiesel Issues

Vegetable Oil Supply

- Grow more oil seeds
 - Canola, soy, mustard seed, ...
 - Higher oil yield varieties
 - More acreage - fence post to fence post
- Install more biodiesel capacity
 - Relatively inexpensive and easy



Stepan Company

- Largest biodiesel producer in Illinois
 - Produced biodiesel for six years
 - 22 million gallons capacity
 - Engineered expansion to 40 million gallons
- Stepan
 - Primary business – chemicals for consumer products
 - » e.g. Detergents, personal care products
 - Headquartered in Northfield Illinois
 - NYSE: SCL
 - Sales of \$1 billion

